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SOIL ROBBING AND SUBSOIL FARMING
ON
SUBMARGINAL LAND MUST COME TO AN END

Soil erosion is one of the greatest problems with which the nation is confronted. We have rapidly denuded our hillsides of forest. We cultivated these steep slopes producing insufficient vegetative covering, thus permitting accelerated erosion to remove our fertile top soil. As a result, we have created an ever increasing number of subsoil farmers with rapidly diminishing incomes.

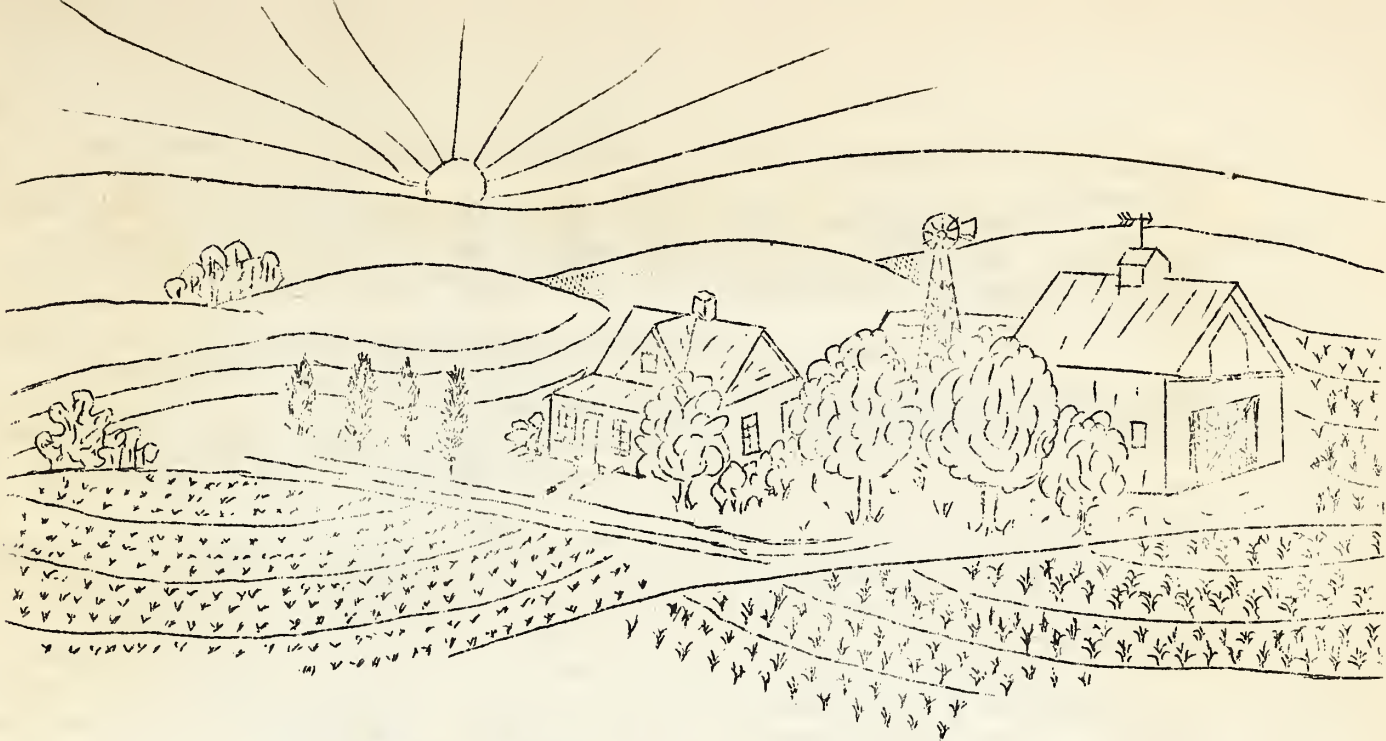
The object of the Soil Conservation Service is to teach the people to bring back, as far as possible the fertility of the soil, that they may raise adequate crops on less acreage, and plant into trees and place in pastures the submarginal lands and steep slopes that should not be cultivated.

L. E. Rast, Regional Director,
Soil Conservation Service.

U.S. DEPARTMENT OF AGRICULTURE
Soil Conservation Service

THE ART OF JELLYCUM COOKING

By J. B. JELLYCUM
Author of "The Art of Jellycum"
and "The Art of Jellycum"
Published by J. B. JELLYCUM
New York, N. Y.
1915



Gully Dwellers*

Sam Hoskins?" The county judge arose slowly as he repeated his question. "Sam Hoskins?" "Your father can't be the Sam Hoskins who lives out in the Sleepy Valley community?"

"Yes, he's the man."

"The man who used to win all the blue ribbons at the county fair? And you want to get him on the county farm?"

"Judge, its the only thing we can do."

Judge Williams brushed the sweat from his forehead. Then he pulled a roll of musty newspapers from a high shelf. "It seems to me this is the right roll." The judge's fingers were nervous as he brushed the cobwebs from the ends of the papers and carefully untied the string that had held them in tact for twenty years.

"What's all this here stuff got to do with getting my father on the county farm?" Bill Hoskins was almost rude. "What I want is to get the old man a place to eat and sleep."

"Just a minute," Judge Williams parried. "Just a minute. I know I'll find the story; I wrote it myself back in 1914 when I was a reporter for the Log Cabin News. Frank Edwards was editor then and he sent me out to get a story about your father's success as a farmer. He had grown sixty bushels of corn per acre on a twenty-acre field, and . . .

"Here it is. Now, let's see. December 14, 1914. Say, Bill, come over and have a chair. I want to read this to you before we make any plans for the old man.

"Here's the story:

" 'Sam Hoskins of the Sleepy Valley community is not that way himself. He's very much awake. He's a realist, not a dreamer. He does things.

" 'Let's take a glance at Sam's harvest records. Sixty bushels of corn per acre on a twenty-acre field; 600 bushels of sweet potatoes; 30 bales of cotton. Sam didn't save any hay but it's cheap. He'll buy enough

from one of his neighbors for a few dollars to feed his four horses and two cows.

" 'Feed problems don't bother Sam. Neither do food problems. His cellar is a storehouse of all that's good to eat - - Beautiful, delicious apples; pears, golden yellow; and enough canned fruits and vegetables to last for 10 years.

" 'Blue ribbons still decorated many of the jars. When questioned, Mrs. Hoskins said her exhibits at the county fair had won 19 first place ribbons. Sam had 21 ribbons to his credit.

" 'A most unusual group, indeed, is the Hoskins family. With their two children, their beautiful new farm home, and their fertile farm, they make a picture of perfect happiness.' "

The judge laid the paper on his desk.

"That's the story and every word of it is true. I wrote it myself." Judge Williams paused. "Now I want you to tell me what has happened that could have caused Sam Hoskins to be forced to go to the county farm."

Bill Hoskins shifted uncomfortably in his chair. He cast a troubled glance at the half-dead oak standing by the south window of the Judge's office. Then looking straight into the judge's friendly eyes, he answered, "Erosion did it. We're now a group of gully dwellers."

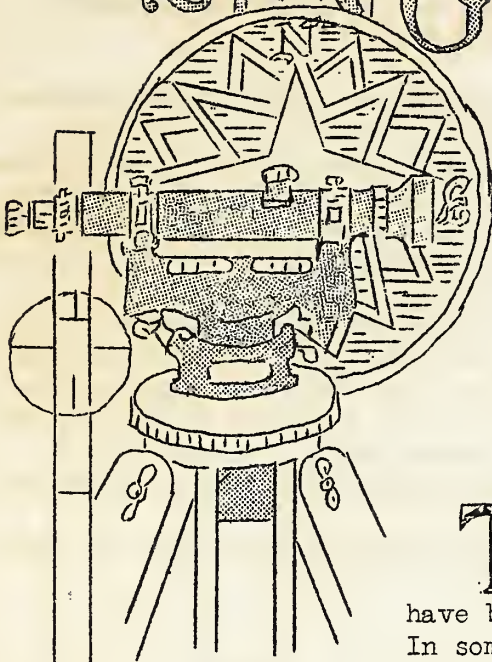
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"Sam Hoskins' plight is one that is becoming all too common in Oklahoma. Erosion has created a social problem of great importance in our state. A study of relief rolls shows that unproductive farms have led thousands of our people to poverty. Farms have been made unproductive by erosion. More than eighty per cent of the farm land in Oklahoma is now suffering either wind or sheet erosion. If steps are not taken to check the present wastage of soils, we will truly be A STATE OF GULLY DWELLERS."

* From July issue of "Sooner State Erosion News", Soil Conservation Service, Stillwater, Oklahoma.



~ENGINEERING~



DISCHARGE CHANNELS

C. W. Chapman
Assistant Agricultural Engineer

The practice of terracing as a means of erosion control has been carried on in this section for many years. Some of our efforts have been rewarded with a certain degree of success. In some cases they have not turned out so well, and at times complete failure has resulted.

Considerable theory has been advanced as to the reasons for the ineffectiveness of our terracing practices. Inadequate surveys, inadequate construction, failure to eliminate low places in the terrace ridge where it crosses natural draws, placing the first terrace too far down the slope and incorrect vertical spacing have all contributed materially to our failures.

But even after we have overcome all these obstacles and have successfully conducted the run-off water from the cultivated slopes at low velocities, we still have another and no less important step to make before we have reached our final objective. This water must be conducted to a point where it can be released without causing further erosive action.

Each field, or watershed, to be protected by a terracing system presents a different problem in this respect. If a thickly sodded pasture or densely wooded area on a moderate slope is adjacent to a terraced field and is available, it may be used as an outlet. Often, however, it is necessary to construct a channel and support it with vegetative cover and mechanical structures to control this water and conduct it down the slope. These we call discharge channels,

In our surveys for terracing systems completed to date, we have staked out and written specifications for 22,185 linear feet of these channels. We will endeavor to carry on construction work on these channels during the summer months so that they might be completed and

ready to receive water from the terraces when they are constructed after the crops have been removed in the fall.

In the design of these channels, we have utilized all available information on rainfall and run-off for this section, and the width and depth is such as to take care of severe rainfall conditions. In locating these channels in the fields, we have tried to get them in places where construction would be economical, where they would be most efficient and where they would not interfere with farming operations. In a good many cases we have placed them on land lines. In other cases, we have turned the channels down natural draws in the field. To some it might seem that in the construction of these channels we are taking away from cultivation some very productive soil, but we have only to look about us and see the economic waste resulting from the uncontrolled movement of concentrated run-off down a slope to realize the necessity and practicalness of these channels.

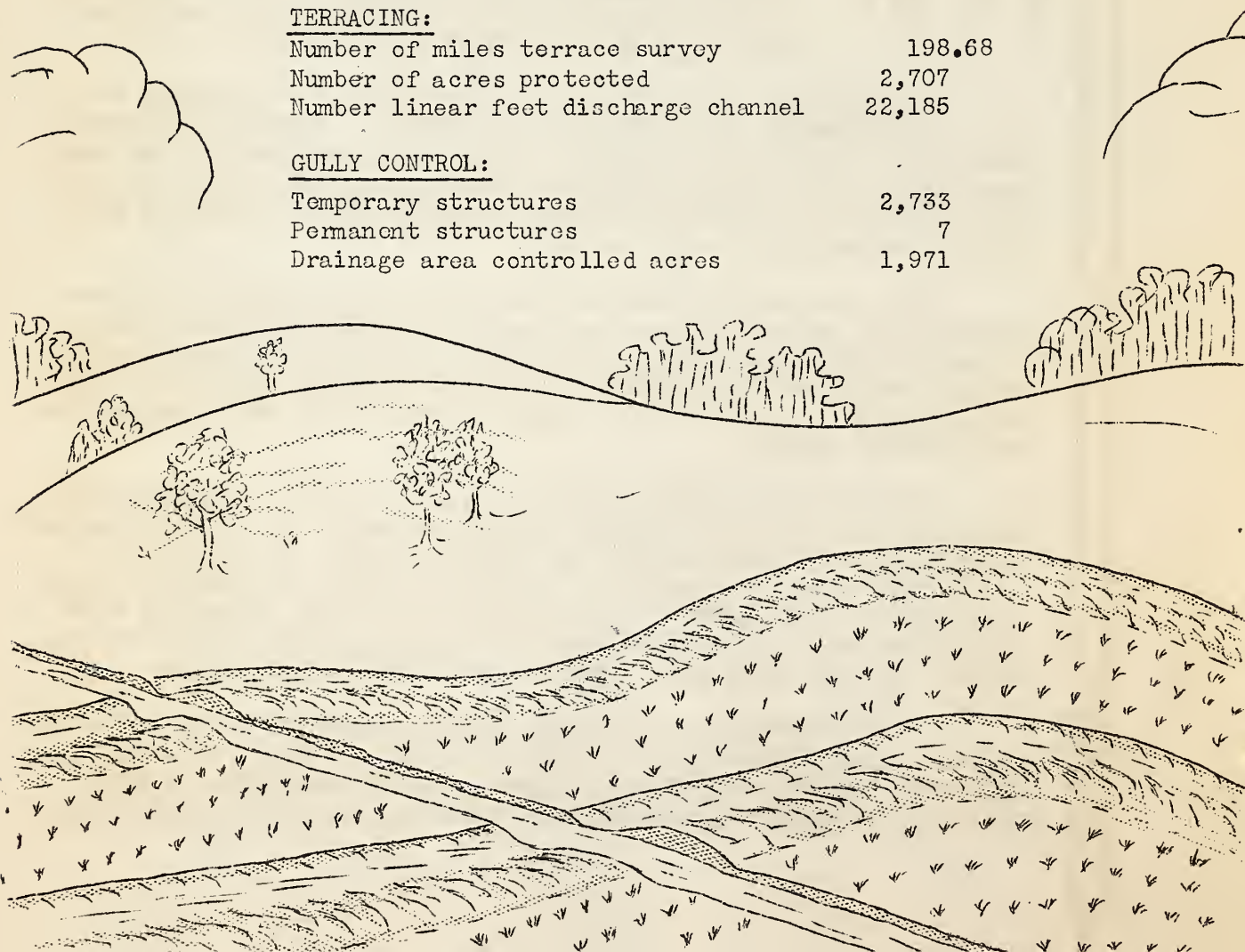
A brief summary of engineering accomplishments since the work began on March 4th, follows:

TERRACING:

Number of miles terrace survey	198.68
Number of acres protected	2,707
Number linear feet discharge channel	22,185

GULLY CONTROL:

Temporary structures	2,733
Permanent structures	7
Drainage area controlled acres	1,971





LAND-USE PROGRAM IS NECESSARY IN PLANNING EROSION CONTROL

At one time this section was a vast forest composed of long leaf and loblolly pines on the upland, and gums, ash, oak, and other hardwood along the streams. Early in the eighteenth century settlers began to clear small patches of land for farming. The number of settlers increased as time went on, and more land was cleared. As the cleared land became unproductive because of erosion and depleted organic matter, more land was cleared, while the idle or abandoned land was allowed to grow up in trees; later this same area was cleared and farmed again. This cycle has been repeated several times until now it is almost impossible to find areas suitable for cultivation that has not been cleared and farmed at one time.

In the early days of our agriculture, when the lands had recently been cleared and soil erosion was not known, most of our soils were light to dark gray. Due to poor farming practices, failing to conserve organic matter, the cultivation of steep slopes and lack of contour farming, erosion soon became a serious problem.

The first effect of soil erosion is the slow but sure removal of the fertile topsoil. This is called sheet erosion and is followed by gullies. Sheet erosion changes the depth, texture and color of the soil. Soils that were gray may be changed to gray and yellow, gray and red, yellow or red, depending on the color of the underlying subsoil. Chocolate red soils are changed to bright red. The texture of the soil may be changed from a sandy loam to a sandy clay loam or even a clay loam by sheet erosion. In some cases both the topsoil and the subsoil have been removed by erosion, leaving only the original material from which the soil was farmed.

Since soil erosion control is a program of conservation it becomes a land-use program as well. Most farmers know from practical experience that certain soils are better adapted to the production of some crops than others. This crop adaptation becomes narrower as erosion increases, crop yields become smaller and farm income decreases. In an erosion control program, the first considera-

tion should be a soil erosion survey of each farm so that the extent and kind of erosion may be determined, as well as all of the many factors that may have influenced erosion on that farm. After the soil erosion survey has been made the information secured is used to work out a plan for that farm which will give practical control for soil losses due to erosion, and at the same time furnish a balanced program for the farmer in the operation of his farm.

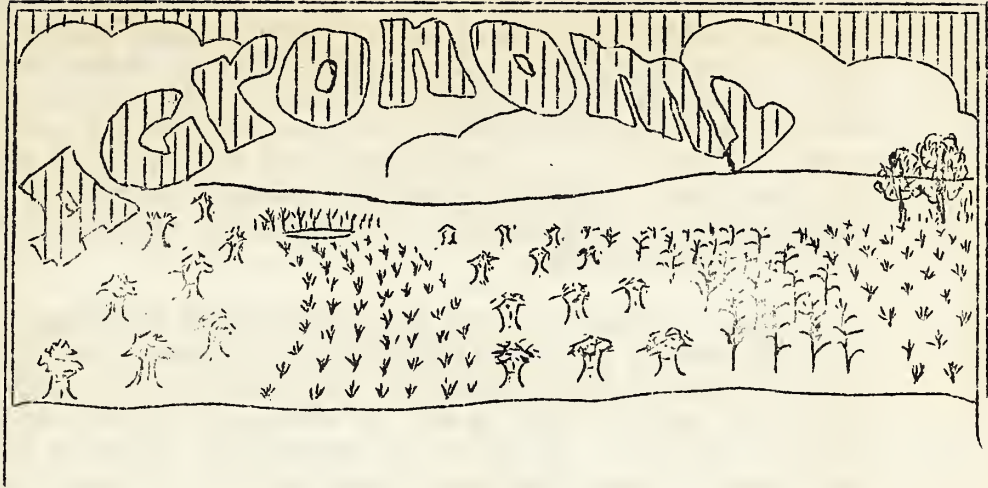
The program of soil erosion control is centered around vegetative growth, because soils covered with close growing crops, such as grasses, vetches, and peas are subjected to very small erosion losses. Thick growing crops hold the soil in place, retard runoff, and act as a filter to keep the soil material on the hillside. Since it is not practical to plant all of our land in close growing crops, other methods must be used so that the necessary crops may be grown with a minimum loss of soil by erosion.

Lands having more than a 12% slope, that is twelve feet of fall in a hundred feet, are extremely difficult to cultivate in row crops without serious erosion losses. Wherever possible these areas should be removed from cultivation and planted to sod or trees, both or either of which will prevent large erosion losses.

Terraces are an essential part of our program on sloping lands, but they are not enough to prevent erosion and should be supplemented by strips of close growing crops. Lands having 3 to 11 per cent should be terraced unless they are sands. Losses on slopes under 3 per cent in most cases can be controlled by the judicious use of strip crops.

The entire program of the Soil Conservation Service is a balanced farm program of land-use, centered around the conservation of the soil which is our greatest national resource. Each individual farmer should plan his farm program so that he may conserve his soil.

P. H. Montgomery,
Junior Soils Expert.



KUDZU *

Kudzu, which is often used in the south as a porch shade plant, has become important as a plant for hay, grazing and for protection of the soil from erosion. Its value for the protection and reclamation of gullied areas cannot be over estimated.

The Kudzu plant is a very vigorous growing perrennial vine belonging to the legume family. It has well developed roots as large or larger in diameter than the vines. When the plants are not crowded the vines grow for long distances, and in contact with moist soil have a tendency to root at each joint.

Kudzu stems with the exception of the large ones, will be killed by cold, but the roots and crowns are able to endure the winters in any part of Georgia.

Best results are gotten by setting out well developed Kudzu roots two to three years old. The work should be done in late winter or early spring in order that the plants may become firmly set before the soil dries out in the spring. Setting plants late in the spring is responsible for a large per cent of the failures with this crop. Rows eight feet wide with plants set five and a half feet in the row, and rows ten feet wide with plants set four and a third feet in a row are most frequently used. This enables an acre to be set with approximately one thousand plants.

On sandy lands the "eyes" can be set two inches below the surface, but on heavy clay soils one inch is preferable. Kudzu plants for setting should never be allowed to dry out or to sprout much before being set out.

If the stand is to thicken, the nodes of the vines must come in contact with the soil and remain there long enough for the roots to form and become well set. Kudzu does not send down roots from the joints except in damp or wet weather. For this reason, dry summers are poor seasons for getting Kudzu established, and wet summers are favorable if the weeds are kept down. Limited amounts of manure and fertilizer have been used with good results in stimulating the early development of Kudzu plants.

The practice of planting corn between the Kudzu rows and cultivating the two crops just as for corn is very desirable in getting Kudzu started. One or more later cultivations after the corn is laid by may be advisable if the weeds are growing rapidly. The second year corn can again be planted in the spaces between the Kudzu rows, and on the third year the Kudzu will most probably have the land well covered. Care should be taken that vines which have become attached to the soil by roots sent out from the nodes be not torn loose in cultivation.

Close growing crops which fill the soil with roots and gives a complete soil covering are effective in erosion prevention. After established a Kudzu field gives almost complete protection from erosion. When set on ditch banks which have been sloped enough to enable the plants to become established, Kudzu will help to prevent farther expansion of the ditch. Kudzu has proven its value as a plant for slopes too steep for profitable production.

* Extract from Bulletin No. 356, University of Georgia
Agricultural Extension Service.

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One of the best examples of gully control to be found anywhere in this section of the state may be seen from Highway No. 41, about one-half mile north of Buena Vista. A large gully, about forty-five feet deep, has been completely stabilized by a heavy growth of Kudzu. Another large gully just a few rods away is just beginning to get a growth of Kudzu started.

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FARM MANAGEMENT



A complete soil conservation program must include a system of farm practices that will give the maximum net returns, and maintain the fertility of the soil with the greatest possible degree of erosion control.

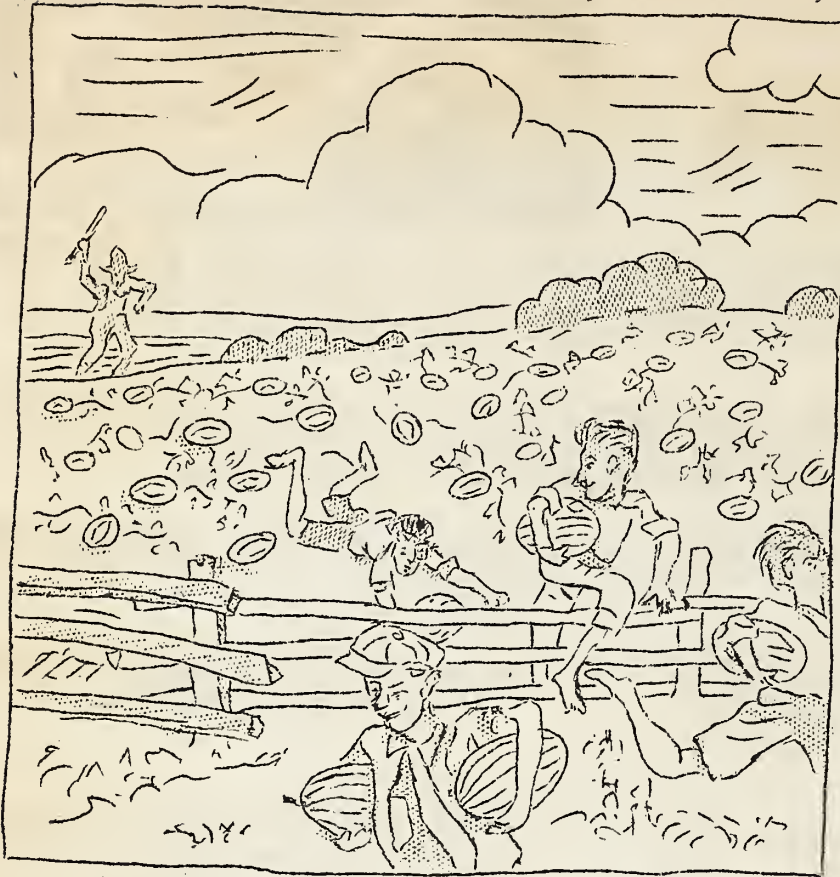
Erosion, farm mortgages, abandoned land, dilapidated homes and floods follow:

1. Single-crop system of farming. (Lowers crop yields, depletes soil fertility, accelerates erosion.)
2. Burning of crop residues. (Destroys organic matter.)
3. Inadequate or unstudied use of commercial plant foods.
4. Uncontrolled surface water.
5. Poor preparation of land and cultural practices.
6. Insufficient number of plants per acre. (Accelerates erosion and reduces yields.)
7. Inefficient control of insects and diseases.
8. Cultivation of land with rows running down the slopes.

Stabilized erosion, comfortable homes, flood control and fertile soils follow:

1. Crop rotation. (Balances production, increases yields.)
2. Plow under soybeans, Sudan grass, lespedeza, crotalaria, cow peas, and velvet bean strips to maintain adequate supply of humus in soil.
3. Plan definite system of soil improvement through combined use of commercial plant foods and cover crops.
4. Plant strip crops on contours (in addition to terracing program.)
5. Thorough preparation and cultivation bring returns in increased production.
6. Plant crops that will give the greatest protection from erosion.
7. Treat seed before planting where needed.
8. A contour system for each field carefully arranged by experienced engineers in order that a maximum amount of crops can be successfully produced on a minimum amount of land.

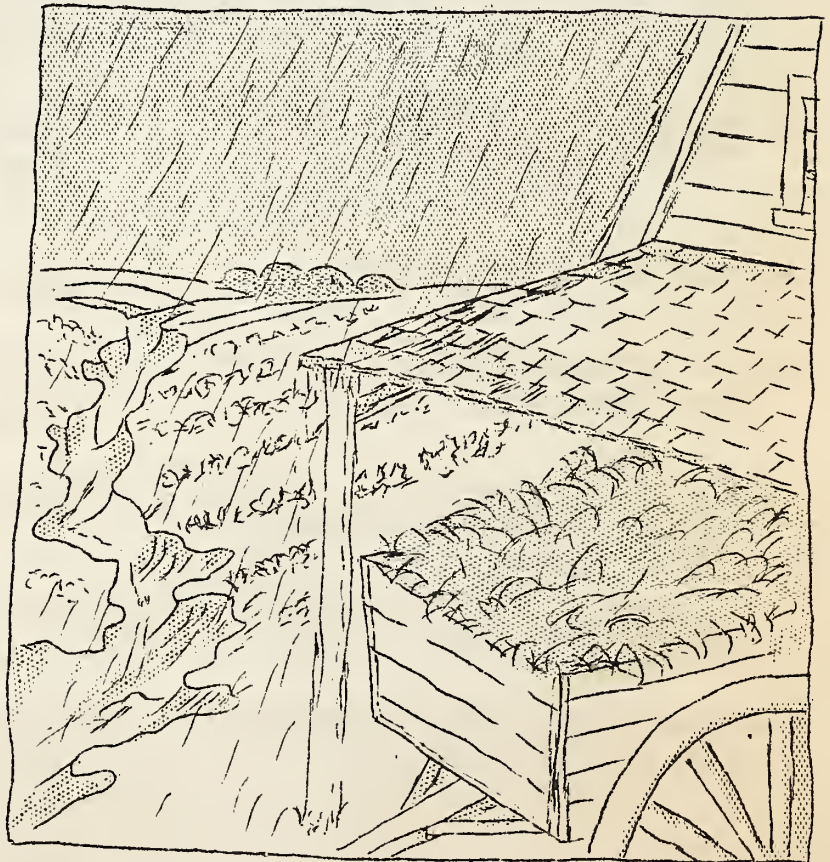
It is only natural that;

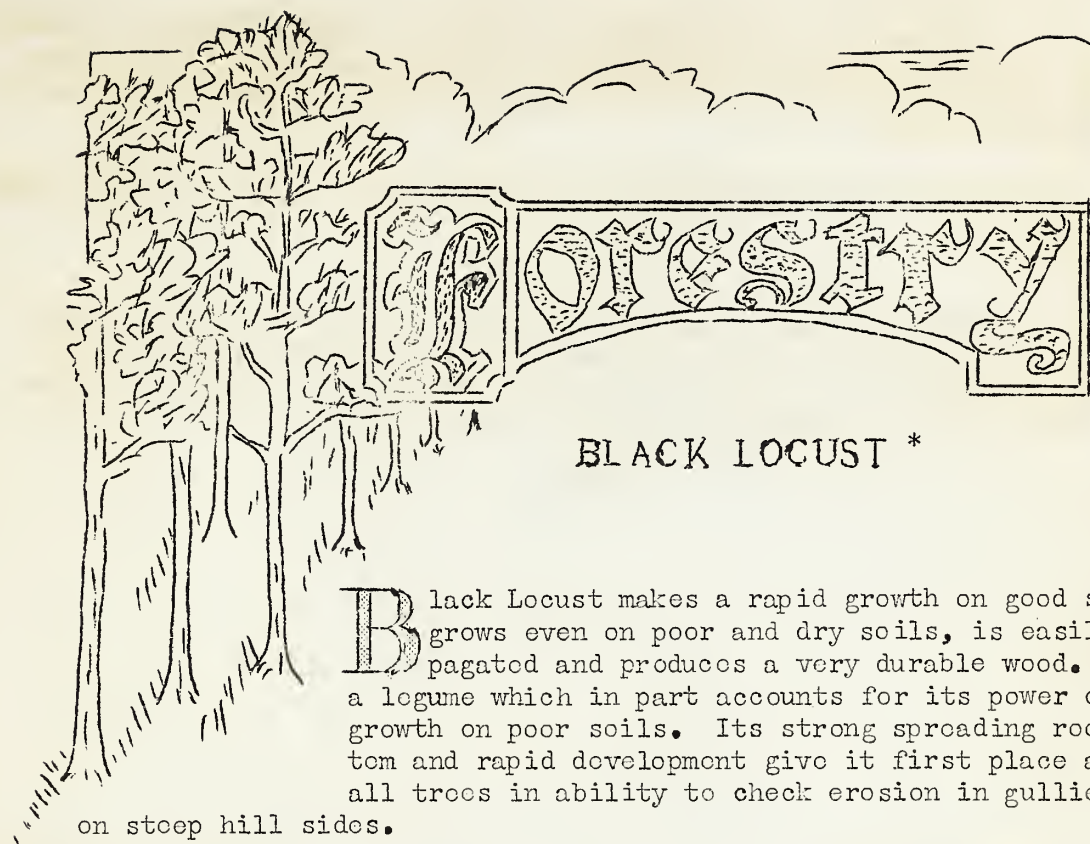


We
get
excited
if
some
one
steals
our
watermelons,

but,

We
are
apt
to
let
our
soil
wash
away
without
paying
much
attention.





BLACK LOCUST *

Black Locust makes a rapid growth on good soils, grows even on poor and dry soils, is easily propagated and produces a very durable wood. It is a legume which in part accounts for its power of growth on poor soils. Its strong spreading root system and rapid development give it first place among all trees in ability to check erosion in gullies and

on steep hill sides.

The wood is heavy, hard, and very durable. It is extensively used for fence posts, the heartwood lasting from 15 to 30 years and some times more than 50 years.

Widely known as a tree of exceptional value for checking soil washing, black locust has come to be used in many regions for that purpose. It is often seen growing naturally on steep banks along roadsides or on railroad cuts and fills. Often it is the only tree found in such places. It reproduces itself freely from root suckers as well as from stump sprouts.

Where the soil and climate are favorable, the growth should average from one-quarter to one-half inch a year in diameter after the first five years or so, and from one to two feet in height. Under such conditions it will yield fence posts in 10 to 20 years.

The black locust produces good seed in abundance. It also sprouts vigorously after being cut back. Thus, it is easy both to start a tract of young trees and to get another generation of trees following cutting.

If seedlings are used for planting the seed are sown in the early spring in a well prepared seed bed. By fall these seedlings should be mostly from two to three feet high. The best time for planting locust seedlings is in early spring before the buds begin to swell.

An average good spacing for setting locust seedlings or sprouts is six feet apart each way; but on eroding lands where a soil binder is especially desired, they may be spaced five feet apart, or four by six feet apart.

* Extract from U. S. Department of Agriculture Farmers' Bulletin 1628.

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Black locust is being used extensively in the Muckalee Creek Soil Conservation project in erosion control, and should be made a part of the farm cropping plan, for in addition to erosion control, black locust is a valuable crop for fence posts.

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UNITED STATES
DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Americus, Georgia

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